

101. 101010110001001000110100010101101  
102. 101010110001001000110100010101110  
103. 101010110001001000110100010101100  
104. 101010110001001000110100010101000  
105. 101010110001001000110100010110000  
106. 101010110001001000110100010100000  
107. 101010110001001000110100011000000  
108. 101010110001001000110100010000000  
109. 101010110001001000110100100000000  
110. 101010110001001000110101000000000  
111. 101010110001001000110110000000000  
112. 101010110001001000110100000000000  
113. 101010110001001000111000000000000  
114. 101010110001001000110000000000000  
115. 101010110001001000100000000000000  
116. 101010110001001001000000000000000  
117. 101010110001001010000000000000000  
118. 101010110001001100000000000000000  
119. 101010110001001000000000000000000  
120. 101010110001010000000000000000000  
121. 101010110001100000000000000000000  
122. 101010110001000000000000000000000  
123. 101010110010000000000000000000000  
124. 101010110100000000000000000000000  
125. 101010111000000000000000000000000  
126. 101010110000000000000000000000000  
127. 101010100000000000000000000000000  
128. 101011000000000000000000000000000  
129. 101010000000000000000000000000000  
130. 101100000000000000000000000000000  
131. 101000000000000000000000000000000  
132. 110000000000000000000000000000000

**Figure 1 (Prior Art)**

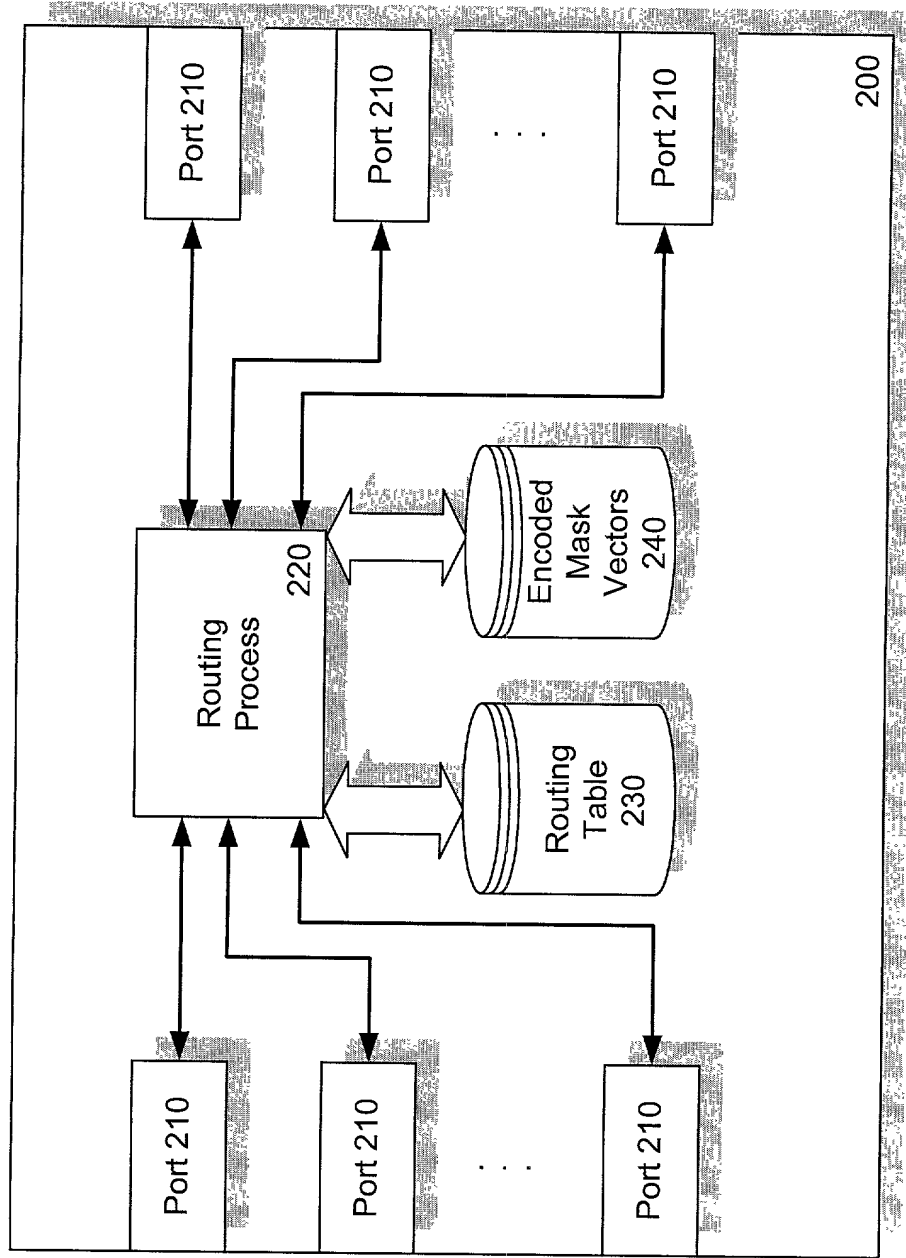


Figure 2

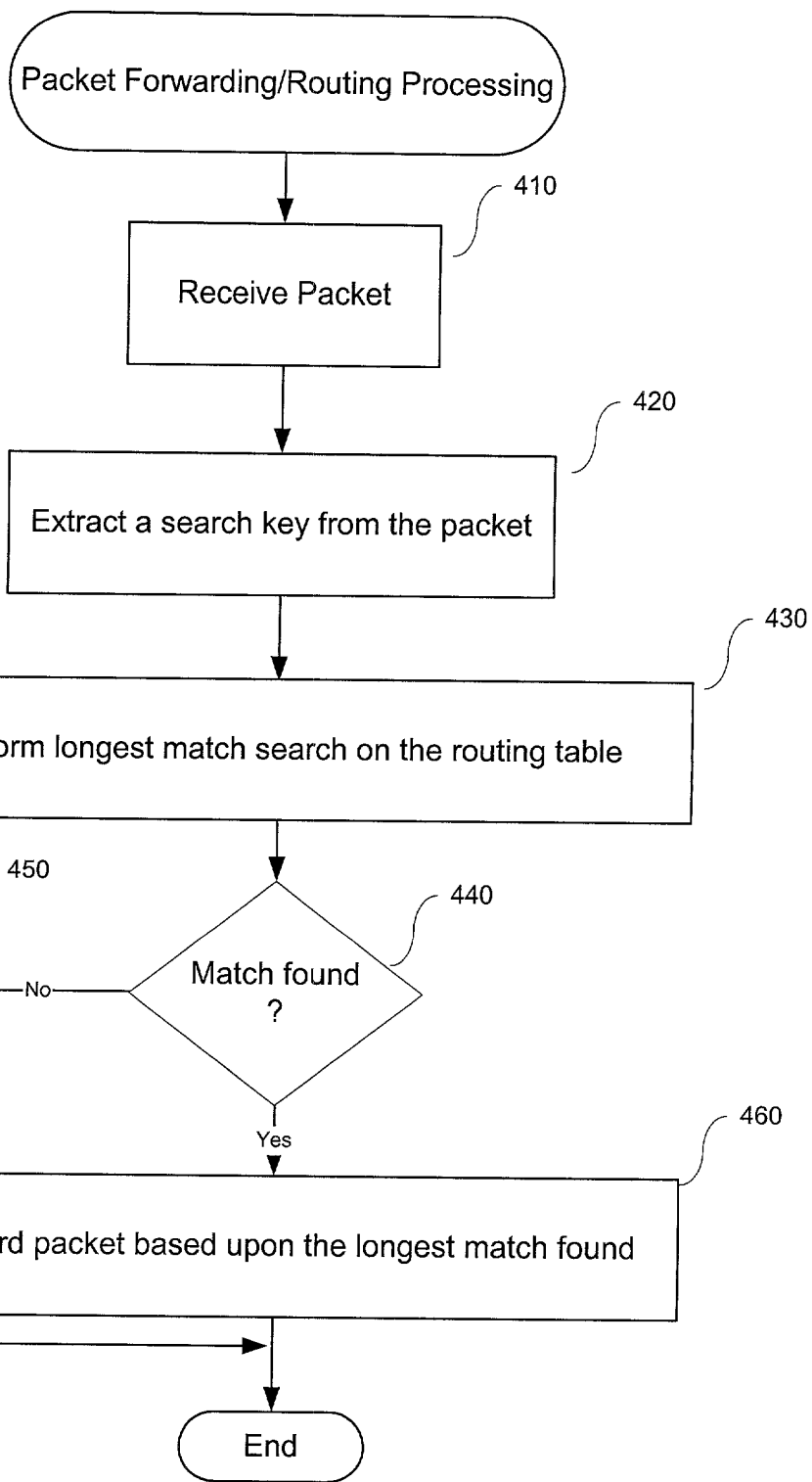
FIG. 3 is a schematic diagram of a routing table 300, which is a data structure used to store routing information. The routing table 300 is organized into a table with two columns: "Address 310" and "Payload 320". The "Address 310" column contains binary strings, and the "Payload 320" column contains the corresponding payload data. The routing table 300 is shown as a table with three rows of data. The first row shows a binary address string "000010110000000010000000101000000000" and a payload "Payload". The second row shows a binary address string "0000101100000000000000000000000000000000" and a payload "Payload". The third row shows a binary address string "0000101100000000110000000000000000000000" and a payload "Payload". The routing table 300 is also labeled with a reference numeral 300.

Routing Table  
300

Address 310		Payload 320
⋮		⋮
000010110000000010000000101000000000		Payload
⋮		⋮
000010110000000000000000000000000000		Payload
⋮		⋮
000010110000000011000000000000000000		Payload

Figure 3

Figure 4 is a flowchart illustrating a packet forwarding/routing process. The process begins with a start node (410) labeled "Packet Forwarding/Routing Processing". This leads to a process node (420) labeled "Receive Packet". From there, the process continues to another process node (430) labeled "Extract a search key from the packet". The next step is a process node (440) labeled "Perform longest match search on the routing table". This leads to a decision node (450) labeled "Match found?". If the answer is "No", the process proceeds to a process node (460) labeled "Protocol dependent processing". If the answer is "Yes", the process proceeds to a process node (470) labeled "Forward packet based upon the longest match found". Both paths (from 460 and 470) lead to an end node (480) labeled "End".



**Figure 4**

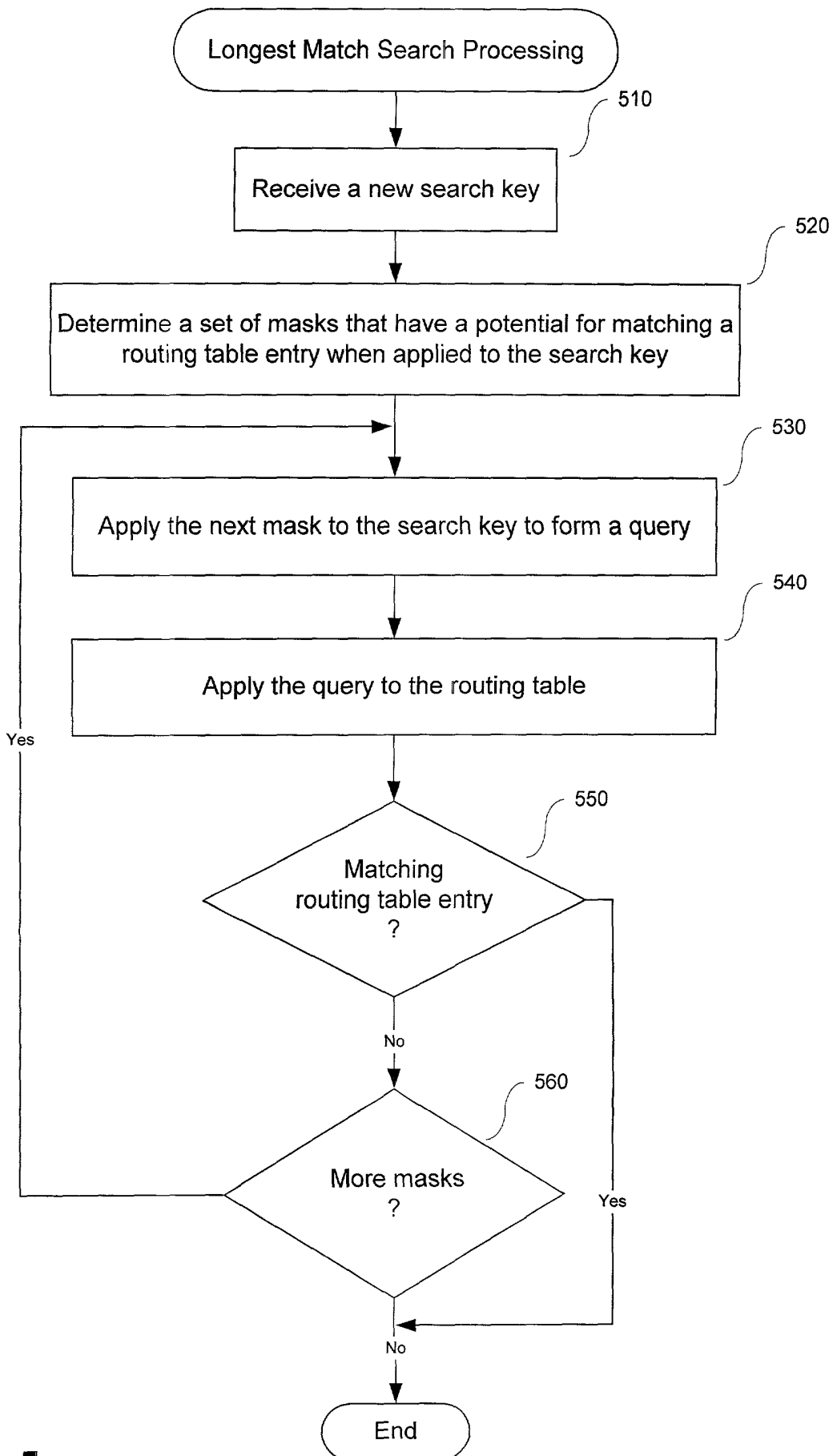


Figure 5

FIG. 6 is a diagram illustrating a routing table and a mask table. The routing table 600 includes an address field 610 and a payload field 620. The mask table 650 includes an index field 660 and an encoded mask vector field 670. The routing table 600 is shown with several entries, including AB.CD.EF.00/24, AB.CD.EF.80/25, AB.CD.EF.82/32, 01.23.45.00/24, and AB.00.00.00/8. The mask table 650 is shown with several entries, including ABCD, 0123, AB00, AB01, AB02, and ABFF. The diagram illustrates how the routing table 600 and the mask table 650 are used to route traffic. For example, the entry AB.CD.EF.00/24 in the routing table 600 is associated with the entry ABCD in the mask table 650. The entry AB.CD.EF.80/25 in the routing table 600 is associated with the entry 0123 in the mask table 650. The entry AB.CD.EF.82/32 in the routing table 600 is associated with the entry AB00 in the mask table 650. The entry 01.23.45.00/24 in the routing table 600 is associated with the entry AB01 in the mask table 650. The entry AB.00.00.00/8 in the routing table 600 is associated with the entry AB02 in the mask table 650. The diagram also shows that the routing table 600 and the mask table 650 are used to route traffic to a destination. For example, the entry AB.CD.EF.00/24 in the routing table 600 is used to route traffic to a destination with an address in the range AB.CD.EF.00.00 to AB.CD.EF.00.255. The entry AB.CD.EF.80/25 in the routing table 600 is used to route traffic to a destination with an address in the range AB.CD.EF.80.00 to AB.CD.EF.80.255. The entry AB.CD.EF.82/32 in the routing table 600 is used to route traffic to a destination with an address in the range AB.CD.EF.82.00 to AB.CD.EF.82.255. The entry 01.23.45.00/24 in the routing table 600 is used to route traffic to a destination with an address in the range 01.23.45.00.00 to 01.23.45.00.255. The entry AB.00.00.00/8 in the routing table 600 is used to route traffic to a destination with an address in the range AB.00.00.00.00 to AB.00.00.00.255.

Routing Table  
600

Address 610	Payload 620
⋮	⋮
AB.CD.EF.00/24	⋮
⋮	⋮
AB.CD.EF.80/25	⋮
⋮	⋮
AB.CD.EF.82/32	⋮
⋮	⋮
01.23.45.00/24	⋮
⋮	⋮
AB.00.00.00/8	⋮
⋮	⋮

Mask Table  
650

Index 660	Encoded Mask Vector 670
⋮	⋮
ABCD	01000181
⋮	⋮
0123	00000100
⋮	⋮
AB00	01000000
AB01	01000000
AB02	01000000
⋮	⋮
ABFF	01000000
⋮	⋮

Figure 6

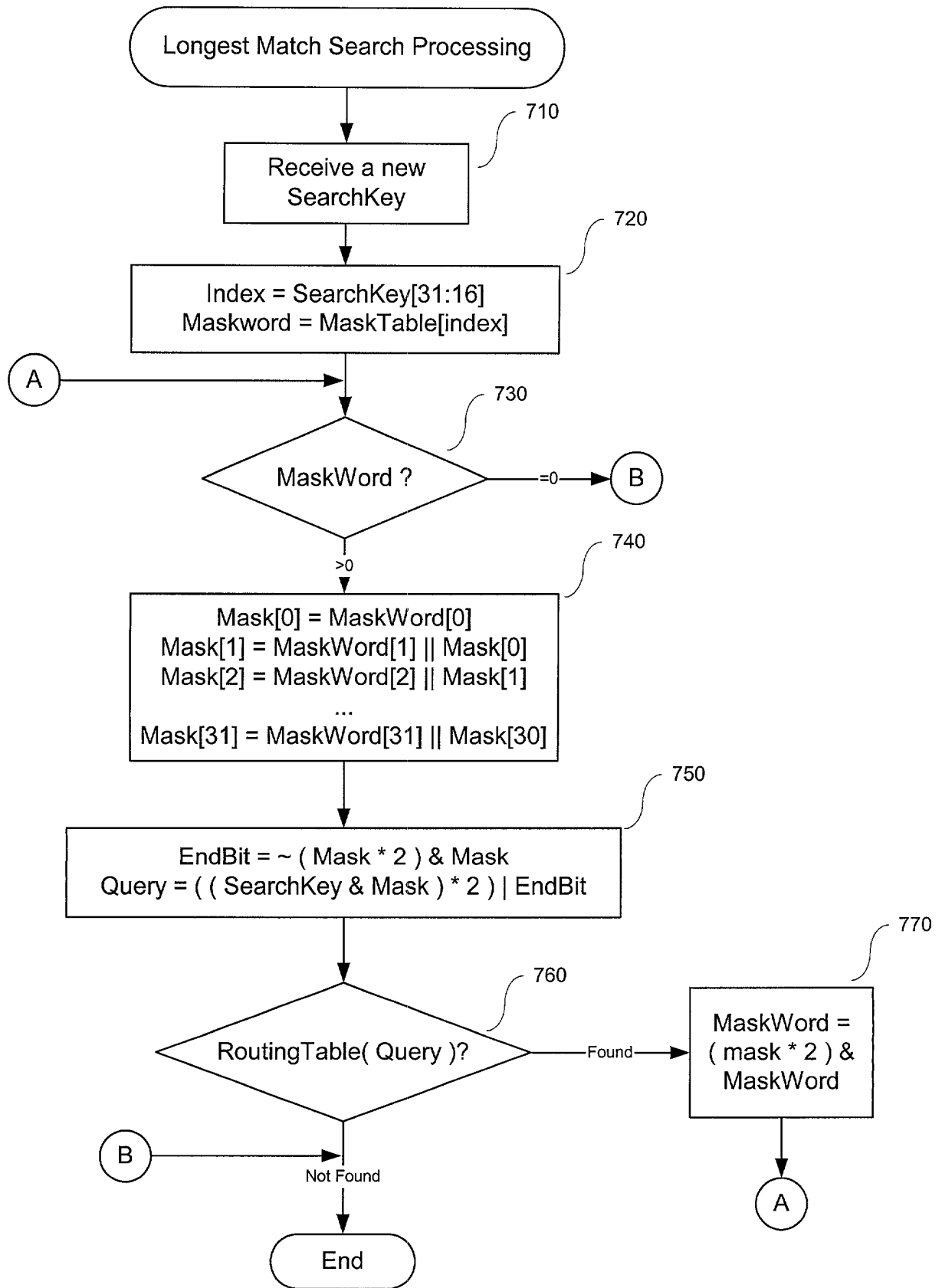
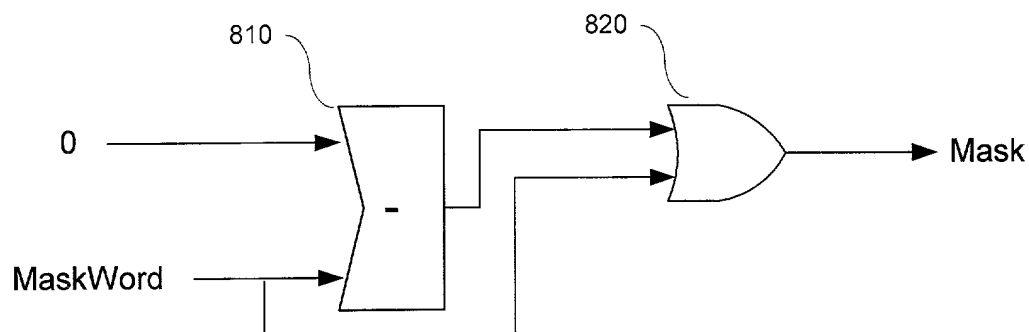


Figure 7



**Figure 8**

910		
920	MaskWord	0001000100010000
930	0 - MaskWord	1110111011110000
	Mask	1111111111110000

**Figure 9**

910		
930	MaskWord	0001000100010000
1010	Mask	1111111111110000
1020	Mask * 2	1111111111110000
	New MaskWord	0001000100000000

**Figure 10**